



[4910-13-P]

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2020-0179; Project Identifier MCAI-2019-00125-E; Amendment 39-21102; AD 2020-05-01]**

**RIN 2120-AA64**

**Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate Previously Held by Rolls-Royce plc) Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule; request for comments.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for all Rolls-Royce Deutschland Ltd. & Co KG (RRD) Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, and Trent 1000-R3 model turbofan engines. This AD requires initial and repetitive borescope inspections (BSI) of the high-pressure turbine (HPT) blades. This AD also requires replacement of HPT blades with parts eligible for installation when the HPT blades fail inspection or reach the new life limit. This AD was prompted by the manufacturer identifying that the HPT blades may fail prematurely. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The FAA must receive comments on this AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC, 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this final rule, contact Rolls-Royce Deutschland Ltd & Co KG, Eschenweg 11, 15827 Blankenfelde-Mahlow, Germany; phone: +49 (0) 33 708 6 0; email: <https://www.rolls-royce.com/contact-us.aspx>. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA, call 781-238-7759. It is also available on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0179.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0179; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness

information (MCAI), the regulatory evaluation, any comments received, and other information. The street address for Docket Operations is listed above. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Stephen Elwin, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781-238-7750; fax: 781-238-7236; email: [stephen.l.elwin@faa.gov](mailto:stephen.l.elwin@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**Discussion**

The European Union Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2019-0099R2, dated September 6, 2019 (referred to after this as “the MCAI”), to address an unsafe condition for the specified products. The MCAI states:

In-service experience with Trent 1000 TEN engines has shown that the affected parts may deteriorate, despite being subject to the inspections and life limits as specified in the current Rolls-Royce Time Limits Manual, T-Trent-10RRT, Chapters 05-10 and 05-20.

This condition, if not detected and corrected, could lead to HPT blade failure, possibly resulting in engine in-flight shut-down (IFSD) and consequent reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce developed instructions to de-pair engines with a certain number of combined flight cycles (FC). In addition, an FC limit was determined when one affected engine is installed. Finally, an on-wing borescope

inspection method has been introduced, and Rolls-Royce issued the NMSB accordingly.

For the reasons described above, EASA issued AD 2019-0099 (later revised) to require repetitive inspections of the affected parts to detect axial cracking and, depending on findings, removal from service of the engine for in-shop replacement of the affected parts. That [EASA] AD also introduced de-pairing instructions and limitations.

Since EASA AD 2019-0099R1 was issued, it was determined that, since new blades must be installed (in-shop) as replacement, the definition of ‘serviceable part’ needs to be corrected.

Consequently, this [EASA] AD is revised accordingly, deleting reference to used parts that passed an inspection.

This revised [EASA] AD is still considered to be an interim action and further [EASA] AD action is expected.

You may obtain further information by examining the MCAI in the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0179.

#### **Related Service Information under 1 CFR part 51**

The FAA reviewed RR Alert Non-Modification Service Bulletin (NMSB) Trent 1000 72-AK316, Revision 3, dated July 16, 2019. The NMSB describes procedures for performing a BSI of the HPT blades. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

### **Other Related Service Information**

The FAA reviewed RR Service Bulletin (SB) Trent 1000 72-J550, Initial Issue, dated November 21, 2017. The SB introduces HPT blades with optimized cooling.

### **FAA's Determination**

This product has been approved by EASA and is approved for operation in the United States. Pursuant to our bilateral agreement with the European Community, EASA has notified us of the unsafe condition described in the MCAI and service information referenced above. The FAA is issuing this AD because it evaluated all the relevant information provided by EASA and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

### **AD Requirements**

This AD requires initial and repetitive BSI of the HPT blades. This AD also requires replacement of the HPT blades with parts eligible for installation when the HPT blades fail inspection or reach the new life limit.

### **FAA's Justification and Determination of the Effective Date**

The FAA has found the risk to the flying public justifies waiving notice and comment prior to adoption of this rule because no domestic operators use this product. It is unlikely that the FAA will receive any adverse comments or useful information about this AD from U.S. operators. Therefore, the FAA finds good cause that notice and opportunity for prior public comment are unnecessary. In addition, for this same reason, the FAA finds that good cause exists for making this amendment effective in less than 30 days.

### **Comments Invited**

This AD is a final rule that involves requirements affecting flight safety and was not preceded by notice and an opportunity for public comment. However, the FAA invites you to send any written data, views, or arguments about this final rule. Send your

comments to an address listed under the ADDRESSES section. Include the docket number FAA-2020-0179 and Product Identifier MCAI-2019-00125-E at the beginning of your comments. The FAA specifically invites comments on the overall regulatory, economic, environmental, and energy aspects of this final rule. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about this final rule.

#### **Confidential Business Information**

Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this AD contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this AD, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this AD. Submissions containing CBI should be sent to Stephen Elwin, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

## **Regulatory Flexibility Act**

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to 5 U.S.C. 553 to adopt a rule without prior notice and comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

## **Costs of Compliance**

The FAA estimates that this AD affects no engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
BSI the HPT blades	4 work-hours x \$85 per hour = \$340	\$0	\$340	\$0
Replace the HPT blade set	1,250 work-hours x \$85 per hour = \$106,250	\$1,871,100	\$1,977,350	\$0

## **Authority for This Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. "Subtitle VII: Aviation Programs," describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority

because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

### **Regulatory Findings**

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866, and
- (2) Will not affect intrastate aviation in Alaska.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **Adoption of the Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

**§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

**2020-05-01 Rolls-Royce Deutschland Ltd & Co KG (Type Certificate Previously Held by Rolls-Royce plc): Amendment 39-21102; Docket No. FAA-2020-0179; Project Identifier MCAI-2019-00125-E.**

**(a) Effective Date**

This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all Rolls-Royce Deutschland Ltd. & Co KG (RRD) (Type Certificate Previously Held by Rolls-Royce plc) Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, and Trent 1000-R3 model turbofan engines.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

**(e) Unsafe Condition**

This AD was prompted by the manufacturer identifying that the high-pressure turbine (HPT) blades may fail prematurely. The FAA is issuing this AD to prevent failure of the HPT blades. The unsafe condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) Before exceeding the compliance time specified in Table 1 to paragraph (g)(1) of this AD, and thereafter at intervals not to exceed 50 HPT blade flight cycles (FCs) since the last inspection, perform an on-wing borescope inspection (BSI) of the HPT blades, part number (P/N) KH10575 (pre-mod/SB 72-J550), or P/N KH64485 (post-mod/SB 72-J550), for cracks.

(i) Use Accomplishment Instructions, paragraph 3.C., of RR Alert NMSB Trent 1000 72-AK316, Revision 3, dated July 16, 2019, to perform the BSI.

(ii) [Reserved]

**Table 1 to Paragraph (g)(1) – Compliance Times**

<b>HPT blade FCs Accumulated (since new or since last in-service HPT blade set replacement)</b>	<b>Compliance Time</b>
Less than 625 HPT blade FCs	Before exceeding 650 HPT blade FCs since new or since last in-service HPT blade set replacement.
625 HPT blade FCs or greater	Within 25 HPT blade FCs after the effective date of this AD.

(2) Within 10 engine FCs after in-flight shutdown (IFSD) of an engine, perform an on-wing BSI of the HPT blades, P/N KH10575 (pre-mod/SB 72-J550), or P/N KH64485 (post-mod/SB 72-J550), for cracks on the not-affected (no IFSD) engine installed on that airplane.

(i) Use Accomplishment Instructions, paragraph 3.C., of RR Alert NMSB Trent 1000 72-AK316, Revision 3, dated July 16, 2019.

(ii) [Reserved]

(3) Remove the full set of HPT blades if any individual HPT blade is found cracked during the on-wing BSI required by paragraph (g)(1) or (2) and replace with a

full HPT blade set eligible for installation within the compliance time specified in Table 2 to paragraph (g)(3) of this AD.

**Table 2 to Paragraph (g)(3) – Compliance Times**

<b>Affected Part Finding(s)</b>	<b>Compliance Time</b>
Cracks exceeding 4 mm (0.16 inch) in length	Before further flight after the effective date of this AD.
Cracks up to and including 4 mm (0.16 inch) in length	Before exceeding 10 HPT blade FCs after the inspection detecting crack(s).

(4) Remove the full set of HPT blades, P/N KH10575 (pre-mod/SB 72-J550), or P/N KH64485 (post-mod/SB 72-J550), after the effective date of this AD, as follows.

(i) Before accumulating 1,000 HPT blade FCs on any engine, or

(ii) Before both engines installed on the airplane accumulate a combined total of 1,400 HPT blade FCs.

**(h) Definitions**

For the purpose of this AD, “HPT blade FCs” are the FCs accumulated by the engine since first flight, or since the last installation of a full set of new HPT blades, whichever occurs later.

**(i) Credit for Previous Actions**

You may take credit for any initial or repetitive BSI of the HPT blades required by paragraph (g) of this AD if you performed the initial or repetitive BSI before the effective date of this AD using RR Alert NMSB Trent 1000 72-AK316, Revision 2, dated April 30, 2019, or earlier versions.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the

certification office, send it to the attention of the person identified in paragraph (k)(1) of this AD. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

(1) For more information about this AD, contact Stephen Elwin, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781-238-7750; fax: 781-238-7236; email: stephen.l.elwin@faa.gov.

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2019-0099R2, dated September 6, 2019, for more information. You may examine the EASA AD in the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating it in Docket No. FAA-2020-0179.

**(l) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce plc (RR) Alert Non-Modification Service Bulletin Trent 1000 72-AK316, Revision 3, dated July 16, 2019.

(ii) [Reserved]

(3) For RR service information identified in this AD, contact Rolls-Royce Deutschland Ltd & Co KG, Eschenweg 11, 15827 Blankenfelde-Mahlow, Germany; phone: +49 (0) 33 708 6 0; email: <https://www.rolls-royce.com/contact-us.aspx>.

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fedreg.legal@nara.gov](mailto:fedreg.legal@nara.gov), or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on February 24, 2020.

Karen M. Grant,  
Acting Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.  
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